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- I. In a Raulin solution + 18.4 per cent NaCl:
A, shows no germination;
B, slight germination;
C, general germination.
- II. In a Raulin solution + 6 per cent NaCl:
A, produces spores in 5 days;
B, produces spores in 4 days;
C, produces spores in $3\frac{3}{4}$ days.
- III. In a Raulin solution, without additional salts:
A, sporification in 4 days;
B, sporification in 5 days;
C, sporification in 5 days, but slight.

Spores from cultures III, *A*, *B*, and *C*, are sowed in Raulin solution + 18.4 per cent NaCl:

- IV. *A'*, after 5 days, no germination;
B', after 5 days, just visible germination;
C', after 5 days, clearly visible germination.

Hence (I and II) the Conidia of *Aspergillus* become adapted to the medium in which their parent is growing, and more adapted after the second generation than after the first.

The adaptation is such that a normal solution is disadvantageous to Conidia adapted to a dense solution.

The adaptation to concentrated medium is not wholly lost after rearing in a normal medium. (IV.) There is a persistence of the adaptation, there is an inheritance of the acquired quality of resistance to concentration.

ZOÖLOGY.

Evans's Birds.—The ninth volume of *The Cambridge Natural History*, comprising the *Birds*, by A. H. Evans,¹ has just come to hand.

Ornithologists have of late years been favored with several general works on the natural history of birds, by competent authors, the main object of which has been to present the results of recent studies of the structure of the various groups composing this class. On the other hand, the usual number of "popular," often inaccurate and

¹ Evans, A. H. *Birds*. The Cambridge Natural History, vol. ix. London, New York, Macmillan, 1899. xvi + 635 pp., 8vo, 144 figs. + 2 polar charts.

gossipy, accounts of the habits of the feathered tribes, without regard to the present status of the *science* of ornithology, appear regularly and find a ready sale. Realizing this, Mr. Evans has set himself a different task in the book before us. In the recent literature he has found no concise general account of the *species* of the birds presented in a popular form, and he consequently planned to give one in the 587 pages of this work. This plan precludes of course any original work, but it is in itself original enough, and daring to a degree. Manifestly a mere enumeration of the species would not do, while even the briefest description of each would more than fill the book. He has consequently been obliged to limit himself "to a short description of the majority of the forms in many of the families, and of the most typical and important of the innumerable species in the large Passerine order." But even with this limitation the task would appear well-nigh impossible. Yet, in going over the book carefully, we have to admit that he has succeeded, and succeeded admirably; for not only has he accomplished the above, but he has given in addition a compressed introduction to avian structure, external and internal; the various groups and divisions are characterized; the habits of the birds are briefly sketched in general terms, mostly under the heads of the families; and the geographical distribution of the species mentioned is often given in considerable detail. Moreover, the fossil birds are treated similarly with the recent forms, and finally 144 woodcuts in the text illustrate the principal types.

Fortunately for Mr. Evans he has been able to accept a thoroughly modern and scientific classification proposed by competent authority. It is but natural that he, as a Cambridge man, should adopt in the main Dr. Gadow's system, and we may add that he might have gone farther and not fared as well. On the other hand, so far as the species and to a great extent also the genera are concerned, he has had the benefit of the now completed series of magnificent volumes constituting the catalogue of birds in the British Museum. Finally he appears to fall back upon the "Strickland Code of Ornithological Nomenclature," the elasticity of which enables those who profess to adhere to it to follow their own ideas, or "common sense," as they are invariably styled. It is thus impossible to quarrel with Mr. Evans where one does not agree with his authorities. He has quoted them, and we have to settle our disputes directly with them.

In judging the size of Mr. Evans's task it must not be forgotten, however, that it is now twenty-five years since the first volume of the bird catalogues of the British Museum was issued, and that he has had

to bring the subject down to date, as exemplified by the "addendum" (p. viii), containing references to forms described during the printing of the *Birds*.

It will be understood that not the least difficult part of the problem has been to introduce the enormous number of species and to present the "dry matter" of their structure, color, and distribution in such a way as not to become monotonous, and to condense the account of the habits sufficiently while yet retaining a readable form. In both respects Mr. Evans has proved himself a master. Where one hardly expects to find room for the mere mention of the names, one is surprised and delighted to find pages brimful of boiled down facts, yet holding one's attention and reading as smoothly as a novel. Mr. Evans has selected for his motto Virgil's *In sicco ludunt fulicæ*, with the equivalent rendition: "Loons disport themselves on dry matters"; but he certainly does not need this humorous apology.

It is plain, however, from what has been said of the plan, that the main value of the book depends on the accuracy of the statements it contains. To verify them all is not the reviewer's task, but in the short time he has had the use of the book he has tested it in many places and many ways, and in every case found it essentially correct. Of course nothing else was expected of Mr. Evans, with his intimate knowledge of the literature and his careful and painstaking method; yet it is pleasing to find that these qualities are paired with a critical skill of no mean order. Moreover, in cases of unusual or uncorroborated statement, Mr. Evans has mostly given his authorities in footnotes. As a matter of fact most of the matter is necessarily second-hand, the responsibility of the author being chiefly confined to the selection, and of course he does not guarantee the accuracy of his informants except in a general way. Thus, on page 313, in speaking of *Sterna longipennis* having "blackish feet," he adds in a footnote that "Mr. Barrett-Hamilton, however, tells the author that the feet are red in life," while as a matter of fact the feet of this species are neither black nor red, but "blackish red" or "dark reddish brown" (Stejn., *Orn. Expl. Kamtsch.*, p. 85).

Most of the illustrations are by Mr. G. C. Lodge, apparently made specially for this book. The majority must be pronounced both accurate and characteristic, while some are admirable in every respect. The sober attitudes of the bird and the total absence of "scenery" are highly commendable. The much admired woodcuts from the *Natural History of Selborne* may be more artistic, but a comparison with those which have been borrowed from the latter work,

for instance, the wryneck and the nuthatch, shows how vastly superior the modern figures are as zoölogical illustrations. In the limited space of this volume much room could not be spared for pictures, but figures are given of representatives of most of the important groups. It may be disputed, however, whether the selection of species illustrated is the best one which could have been made for a book of this scope. Over one-third of the species figured are English, some of them the most common and best known birds with which every reader of the book is thoroughly familiar. It can hardly be doubted that a figure of *Podoces* would have been more valuable than that of the raven, or that *Pyrhuloxia* would have been preferable to the house sparrow. However, the author is probably not to blame in the matter. Editors and publishers usually have a way of interfering with his best intentions — concerning the illustrations.

The author expresses the hope that the work may be of real use, not only to the tyro in ornithology, but also to the traveler or resident in foreign parts interested in the subject, who, without time or opportunity for referring to the works of specialists, may yet need the aid of a concise account of the species likely to cross his path. There certainly was a need of such a book, and the present one meets it as well as it can be done in the limited space. From the treatment of the various groups I may add that the class of people most likely to derive the greatest benefit from the book is the traveling sportsman with an eye open for other birds and game in the strictest sense. But even the working naturalist, let alone the tyro, will find it an inexhaustible mine of solid ornithological facts.

LEONHARD STEJNEGER.

Blind-Fishes of the Caves. — In *Science* for February 24, Dr. Carl H. Eigenmann describes a new genus of blind-fishes, which he finds a remarkable case of the convergence of characters. The species, first obtained by Mr. Garman from the caves of Missouri, was identified by him with *Typhlichthys subterraneus*, a blind species inhabiting the caves of the Ohio Valley. The two forms are almost identical superficially, but Dr. Eigenmann finds in fresh material abundant evidence that they are descended from distinct forms. The genus *Chologaster*, of the swamps of the South, is regarded as evidently the ancestor of *Typhlichthys*, but the new form from Missouri, called by Eigenmann *Troglichthys rosæ*, must have had a different ancestry in the same family. "Judging from the degree of degeneration of the eye, *Troglichthys* has lived in caves and done